

NEW MARINE NEMATODES FROM OFF  
THE COAST OF SOUTH AFRICA

BY

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*Pp.* 529-552 ; 42 *Text-figures*

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# NEW MARINE NEMATODES FROM OFF THE COAST OF SOUTH AFRICA

By WILLIAM G. INGLIS

## SYNOPSIS

Eight new species and two new genera of free-living marine nematodes are described from off the coast of South Africa, thus : Desmodoridae : *Desmodora cuddlesae* sp. nov.; *Bla nini* gen. et sp. nov.; *Sigmophora brevispiculata* sp. nov. Cyatholaimidae : *Choniolaimus wieseri* sp. nov.; *Longicyatholaimus dayi* sp. nov.; *Xyzzors fitzgeraldae* gen. et sp. nov. Comesomatidae : *Mesonchium janetae* sp. nov. Linhomoeidae : *Linhomoeus timmi* sp. nov. The form of the lateral differentiation in the genus *Mesonchium*, in particular, and the families Cyatholaimidae, Chromadoridae and Comesomatidae, in general, is discussed and it is concluded there is a fixed relationship between the total area of the differentiation and the area of the punctations which compose it. It is suggested that the punctations are canals which are associated with moulting.

THROUGH the courtesy of Professor J. H. Day of the University of Cape Town, Republic of South Africa I have been able to study some free-living marine nematodes collected by the Department of Oceanography of that University. The majority of the specimens are enoploids and will be the subject of a separate publication while the present report deals with the non-enoploid species only. All the specimens were picked by hand from material brought up by a trawl or grab and were fixed and preserved in formalin. Their condition is rather poor, the most obvious result being the apparent loss of body setae, but sufficiently good to warrant description.

The specimens were studied in glycerine after clearing by the slow method described elsewhere (Inglis, 1962).

There are eight new species, two of which are further referred to new genera, thus :

### **CHROMADORIDEA.**

#### ***Desmodoridae.***

*Desmodora cuddlesae* sp. nov. (p. 532).

*Bla nini* gen. et sp. nov. (p. 534).

*Sigmophora brevispiculata* sp. nov. (p. 537).

#### ***Cyatholaimidae.***

*Choniolaimus wieseri* sp. nov. (p. 539).

*Longicyatholaimus dayi* sp. nov. (p. 542).

*Xyzzors fitzgeraldae* gen. et sp. nov. (p. 544).

#### ***Comesomatidae.***

*Mesonchium janetae* sp. nov. (p. 547).

### **MONHYSTERIDEA.**

#### ***Linhomoeidae.***

*Linhomoeus timmi* sp. nov. (p. 550).

**CHROMADORIDEA**  
**DESMODORIDAE**

*Desmodora cuddlesae* sp. nov.

*Material Studied*

2 ♂♂. Coarse white sand at a depth of 27 metres. 32° 02' S./18° 17' E. on 2.7.61. (Department of Oceanography reference number: WCD 91). B.M. (N.H.) Reg. No. 1962. 605. (1 ♂ was destroyed accidentally).

<i>a</i>	<i>b</i>	Ratios	<i>c</i>	<i>Body Length (mm.)</i>
34.5	7.0		13.5	1.76
38.8	8.6		14.1	1.98

*Measurements (in mm. in order of body lengths above)*

Body breadth : 0.051 ; 0.051. Oesophagus length : 0.25 ; 0.23. Oesophagus bulb length : 0.052 ; 0.050. Head diameter : 0.024 ; 0.024. Diameter of cephalic cap : 0.043 ; 0.039. Length of posterior cephalic setae : 0.004 ; 0.004. Length of body setae : 0.006 ; 0.007. Amphid, length/breadth : 0.038/0.037 ; 0.037/0.026. Distance of anterior edge of amphid from anterior end : 0.012 ; not measured as head very contracted. Tail length : 0.13 ; 0.14. Cloacal diameter : 0.049 ; 0.051. Spicule length : 0.042 ; 0.058. Length of gubernaculum : 0.012 ; 0.016.

*Cuticle*

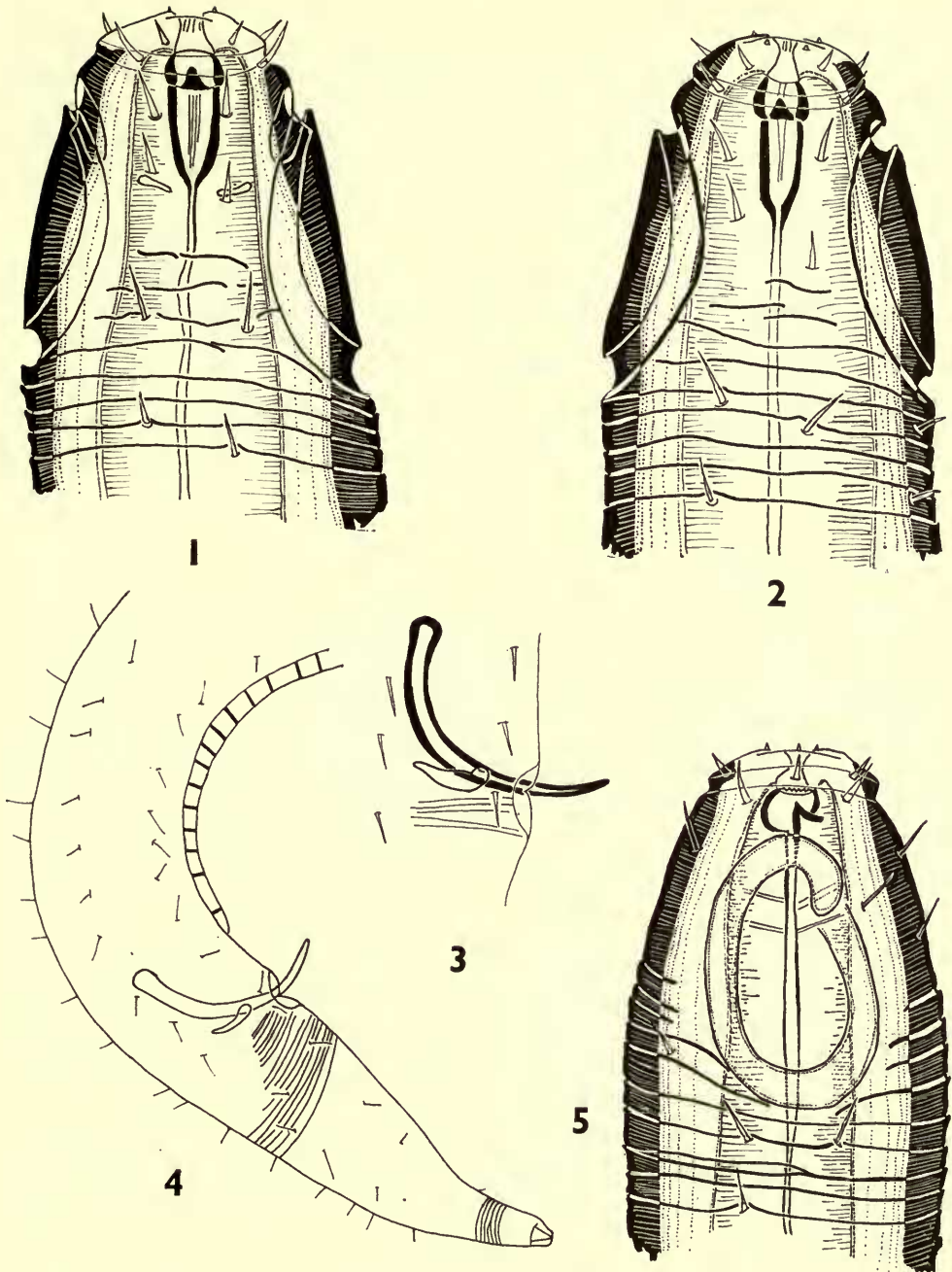
The cuticle is thick with the usual prominent striations so that it appears to be ringed. The anterior end of the body, the cephalic cap, is without striations to about the posterior ends of the amphids (Text-figs. 1, 2, 5). There are six files of longish setae running the whole length of the body. There are no couplings between the cuticular rings.

*Head and Oesophagus*

The head is characterized by very large ovoid amphids and a distinctly off-set lip region (seen in one specimen only as the head is retracted in the other). The lip region carries three circles of setae : an inner circle of six short, an intermediate circle of six longer and an outer circle of four much longer setae (Text-figs. 1, 2, 5). No *en face* view was prepared because of the small number of specimens but from a study of the head from all other aspects the mouth opening appears to be bounded by twelve rugae but this could be a misinterpretation of folded cuticle. The anterior end of the oesophagus is cupped ventrally for the reception of a large tooth-like structure developed from the dorsal sector of the oesophagus while the anterior edge of the oesophagus forms a slightly dentate ring. In lateral view there are what at first appear to be small teeth on the ventral side of the oesophageal cup but more detailed study suggests that this is a misinterpretation of the cupped anterior ends of the ventro-lateral sectors and that, in fact, no teeth are present. Confirmation of this must await the study of the head, or a similar head, in an *en face* preparation.

The oesophagus is typical with a short posterior bulb.





FIGS. 1-5. *Desmodora cuddlesae* sp. nov. Fig. 1. Dorsal view of head. Fig. 2. Ventral view of head. Fig. 3. Detail of spicules and gubernaculum. Fig. 4. Male tail. Fig. 5. Lateral view of head with the dorsal surface to the right.

*Tail and Reproductive Apparatus*

The tail is conoid and the terminal zone is without cuticular markings. Anterior to the cloacal opening is a long thickened ventral area in which there are 20 and 21 (in respective specimens) supplementary organs. I was unable to prepare a ventral view of the tail and am unable to add any other information on the structure of these organs. The spicules are round proximally and taper evenly to fine sharp points distally. The gubernaculum is relatively simple (Text-figs. 3, 4).

*Discussion*

This species is characterized by the very large amphids, the smooth cephalic cap, the non-cephalate spicules and the form of the pre-cloacal supplements.

*Bla nini* gen. et sp. nov.*Material Studied*

2 ♂♂, 2 ♀♀, 1 larva. Coarse white sand at a depth of 27 metres. 32° 02' S./18° 17' E. on 2.7.61. (Ref. No. WCD 91). B.M. (N.H.), Reg. Nos. 1962. 611-614.

	Ratios			V	Body Length (mm.)
	a	b	c		
Males	30.8	7.0	18.6		1.6
	39.1	8.6	19.4		1.8
Females	29.1	8.0	13.9	61.2	1.6
	32.7	7.4	15.5		58.8
Larva	32.6	7.8	12.3		1.4

*Measurements (in mm. in order of body lengths above)*

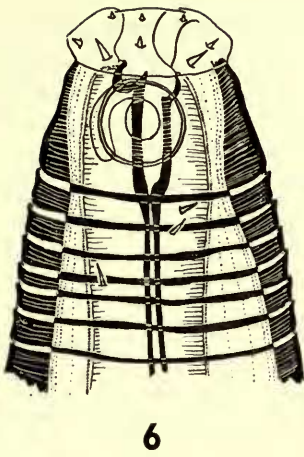
MALES. Body breadth : 0.052 ; 0.046. Oesophagus length : 0.23 ; 0.21. Head diameter : 0.024 ; 0.022. Length of cephalic setae, long/short : 0.006/0.003 ; 0.006/. . . Diameter of amphid : 0.013 ; 0.013. Tail length : 0.086 ; 0.093. Cloacal diameter : 0.049 ; 0.044. Length of dotted terminal portion of tail : 0.030 ; 0.031. Spicule length : 0.047 ; 0.047. Gubernaculum length : 0.018 ; 0.019.

FEMALES. Body breadth : 0.055 ; 0.054. Oesophagus length : 0.20 ; 0.23. Head diameter : 0.020 ; 0.023. Length of cephalic setae, long/short : 0.006/0.003 ; 0.006/0.002. Diameter of amphid : 0.013 ; 0.013. Distance of amphid from anterior end : 0.006 ; 0.007. Tail length : 0.115 ; 0.103. Anal diameter : 0.043 ; 0.046. Length of dotted terminal portion of tail : 0.054 ; 0.044. Distance of vulva from anterior end of body : 0.98 ; 1.00.

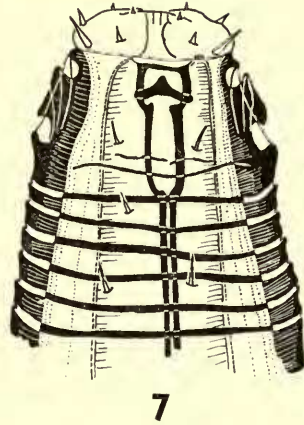
LARVA. Body breadth : 0.043. Oesophagus length : 0.18. Head diameter : 0.023. Length of cephalic setae, long/short : 0.007/not seen. Diameter of amphid : 0.010. Tail length : 0.114. Anal diameter : 0.042. Length of dotted terminal portion of tail : 0.034.

*Cuticle*

The cuticle is thick and has the usual ringed appearance. There are no couplings between the rings. The cuticle of the cephalic cap is without markings of any kind. There are six files of setae running the full length of the body.



6



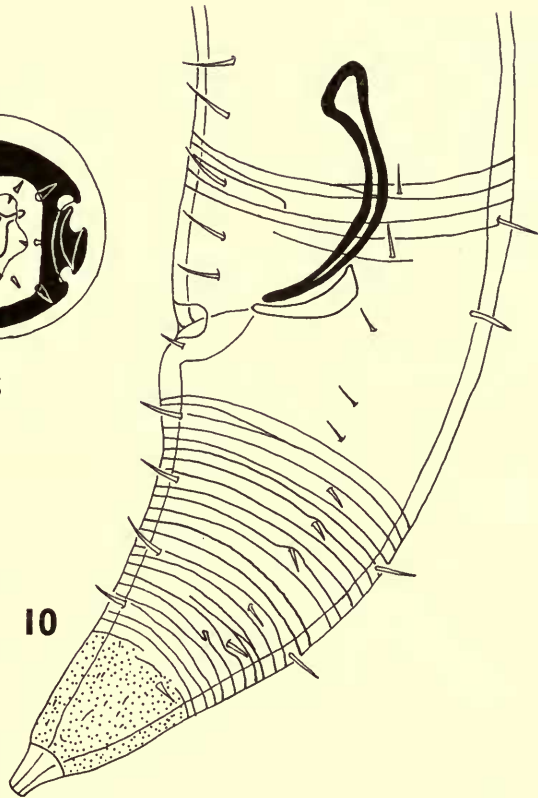
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9



8



10

FIGS. 6-10. *Bla nini* gen. et sp. nov. Fig. 6. Lateral view of head with dorsal surface to the left. Fig. 7. Dorsal view of head. Fig. 8. *En face* view of head. Fig. 9. Oesophagus. Fig. 10. Lateral view of male tail.

### *Head and Oesophagus*

The head bears three circles of setose sense organs, six very short setae in an inner circle, six longer in an intermediate circle and four relatively very long in an outer circle. These setae are all located on an off-set anterior portion of the head, as in the previous species (Text-figs. 6, 7). The large circular and spiral amphids lie immediately posterior to this off-set portion. In all the specimens, except that figured, the head is retracted so that it has not been possible to establish the form of the mouth opening in *en face* view but it has been possible to establish the shape of the buccal cavity and the distribution of the cephalic sense organs (Text-fig. 8). The cavity at the anterior end of the oesophagus into which the prominent dorsal "tooth" projects (Text-fig. 6) is roughly rectangular in shape while the very thick cuticle of the anterior part of the head is also rectangular in cross section. Whether this shows the shape of the part of the buccal cavity anterior to the end of the oesophagus or not is uncertain since there may be tissue lining this space which I have been unable to see. I have been unable to see a dentate ring at the anterior end of the oesophagus, as in *Desmodora cuddlesae*, and the structures usually described as ventral teeth appear to be the anterior edges of the ventro-lateral sectors of the oesophagus seen in optical section.

The oesophagus is expanded posteriorly to form a small bulb with, apparently, one small plasmatic interruption (Text-fig. 9). The oesophagus of *D. cuddlesae* looks exactly the same as this.

### *Tail*

The tail is short and stout in both sexes with the terminal zone marked by circular punctations, or rod elements (Text-fig. 10).

### *Male*

The male tail bears two files of long, stout setae on its ventral surface. The spicules are slightly cephalate proximally and end distally in very sharp points. The gubernaculum is small and lies close to the spicules. There are no pre-cloacal supplements of any kind (Text-fig. 10).

### *Discussion*

The form of the terminal zone of the tail restricts the allocation of this species to one of two genera: *Croconema* Cobb, 1920 or *Xenodesmodora* Wieser, 1951. The first of these genera is characterized by a most unusual and irregular arrangement of the cephalic sense organs (see Schuurmans Stekhoven, 1950; Wieser, 1951) which are distributed in irregular rows on the cephalic cap. Even in *Croconema mammallatum* Steiner and Hoeppli, 1926, where the arrangement of the cephalic setae is least irregular, they are still not arranged in the regular and typical way found in the present species. The second of these genera is characterised by cephalic sense organs arranged in the more typical way, that is in transverse circles, but the type species, *X. porifera* Wieser, 1951, is known on the basis of one female only. Further, the description appears in one of Wieser's earlier publications and is not up to his usual standard so that although the genus is claimed to be further characterized by very small pharyngeal teeth their structure cannot be established



on the basis of Wieser's description or his figures. The dorsal "tooth" in the present specimens is large and prominent and I prefer to refer them to a new genus, at least until a thorough study can be made of specimens referable to *Xenodesmodora* obtained from or near the type locality.

The genus *Bla* may be diagnosed thus :

Desmodoridae : Desmodorinae (sensu Chitwood, 1936) : amphid large, almost circular in shape ; cephalic sense organs setose, arranged in three circles ; dorsal tooth-like structure of oesophagus large ; posterior part of tail with punctations.

Type Species : *Bla nini* sp. nov.

### *Sigmophora brevispiculata* sp. nov.

#### Material Studied

1 ♂, 2 ♀. Khaki mud at a depth of 54 metres. 32° 05' S./18° 16' E. on 2.7.61. (Ref. No. WCD 94). B.M. (N.H.) Reg. Nos. 1962. 608-610.

	Ratios				
	<i>a</i>	<i>b</i>	<i>c</i>	<i>V</i>	Body Length (mm.)
Male	22.2	5.1	15.8		1.8
Females	24.2	7.4	19.6	55.9	2.9
	33.3	7.2	22.6	55.6	3.3

#### Measurements (in mm. in order of body lengths)

MALE. Body breadth : 0.081. Oesophagus length : 0.351. Head diameter : 0.067. Diameter of amphid : 0.018. Tail length : 0.114. Cloacal diameter : 0.090. Spicule length : 0.117. Gubernaculum length : 0.054.

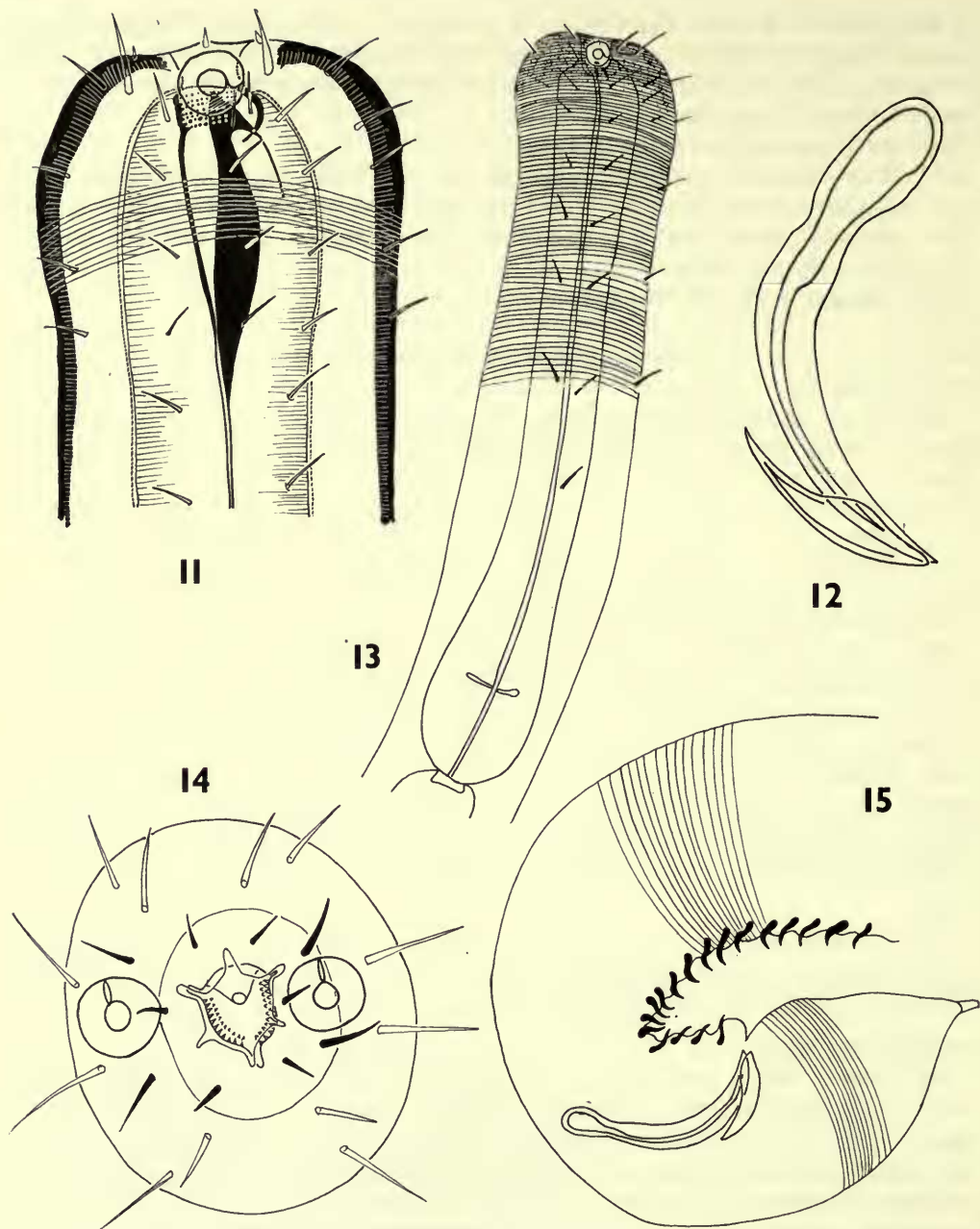
FEMALES. Body breadth : 0.12 ; 0.099. Oesophagus length : 0.390 ; 0.456. Head diameter : 0.063 ; 0.074. Diameter of amphid : 0.017 ; 0.019. Length of cephalic setae : 0.019 ; 0.019. Length of cervical setae : 0.017 ; 0.017. Tail length : 0.148 ; 0.146. Anal diameter : 0.075 ; 0.084. Distance of vulva from anterior end of body : 1.62 ; 1.83. Size of eggs : 0.11 × 0.28.

#### Cuticle

The cuticle is fairly thick and is marked by rather fine striations which continue to the extreme anterior end of the body. There are granulations in the cuticle at the anterior end of the body (Text-fig. 13).

#### Head and Oesophagus

The head is blunt and there is no cephalic helmet. In all the specimens the head is contracted so that the amphids probably appear to lie much further forward than is really the case in life. The amphids are circular and spiral (Text-fig. 11). The mouth opening appears to be bounded by six lip-lobes (Text-fig. 14) but the retracted condition of the head makes this difficult to establish. The mouth appears to be surrounded by an intermediate circle of six short setae and an outer circle of four much longer setae (Text-fig. 14) but the position is complicated by the presence of rows of somewhat similar setae on the cervical region of the body. The presence of an inner circle of sense organs cannot be established because of the contracted head. A large, prominent tooth-like structure is developed from the



FIGS. 11-15. *Sigmophora brevispiculata* sp. nov. Fig. 11. Lateral view of head with dorsal surface to the right. Note the S-shaped dorsal tooth. Fig. 12. Detail of spicules and gubernaculum. Fig. 13. Oesophagus. Fig. 14. *En face* view of head. The setae which are interpreted as composing the cephalic sense organs are solid black. Fig. 15. Lateral view of male tail.

dorsal sector of the oesophagus while the ventro-lateral sectors are cupped with seven rows of denticles on the walls (Text-figs. 11, 14).

The oesophagus is fairly massive with a slight swelling posteriorly but there is no massive bulb nor is there any thickening of the lining of the oesophagus posteriorly (Text-fig. 13).

#### Male

The tail is very short and stout (in both sexes—Text-fig. 15) and there are thirty-nine cuticular crochet shaped supplements anterior to the cloacal opening. These structures are arranged in one median ventral row and each is triple-ended i.e. the distal, projecting end divides into three parts. The gubernaculum is very simple and the spicules are swollen and rounded proximally. They narrow more distally and then taper evenly to a fine point (Text-fig. 12).

#### Discussion

The presence of the crochet shaped pre-cloacal supplements on the male tail restricts the placements of this species to one of two genera, *Sigmophora* Cobb, 1933 or *Onyx* Cobb, 1891. It differs from the species referred to both in the form of the posterior end of the oesophagus, although this may be due to poor fixation and I do not lay too much stress on it. It further differs from the species referred to *Onyx* in the shape of the dorsal tooth, the shape of the pre-cloacal supplements and in the presence of denticles on the ventro-lateral sectors of the buccal cavity. Conversely it resembles the species referred to *Sigmophora* in all three characters, but differs from them in the very short spicules which are in general shape very similar to those illustrated by Filipjev (1918) for *Onyx perfectus* Cobb, 1891, and a little less similar to those shown by Wieser (1954) for *O. septempapillatum* Wieser, 1954. Whether these two genera should continue to be treated as distinct is doubtful, certainly the species referred to *Onyx* form a heterogeneous group. On the other hand the species referred to *Sigmophora* form a much more uniform group from which the present species differs only in the very short spicules. I therefore prefer to refer the South African specimens to the genus *Sigmophora* until further information is available on the two genera *Onyx* and *Sigmophora*.

### CYATHOLAIMIDAE

#### *Choniolaimus wieseri* sp. nov.

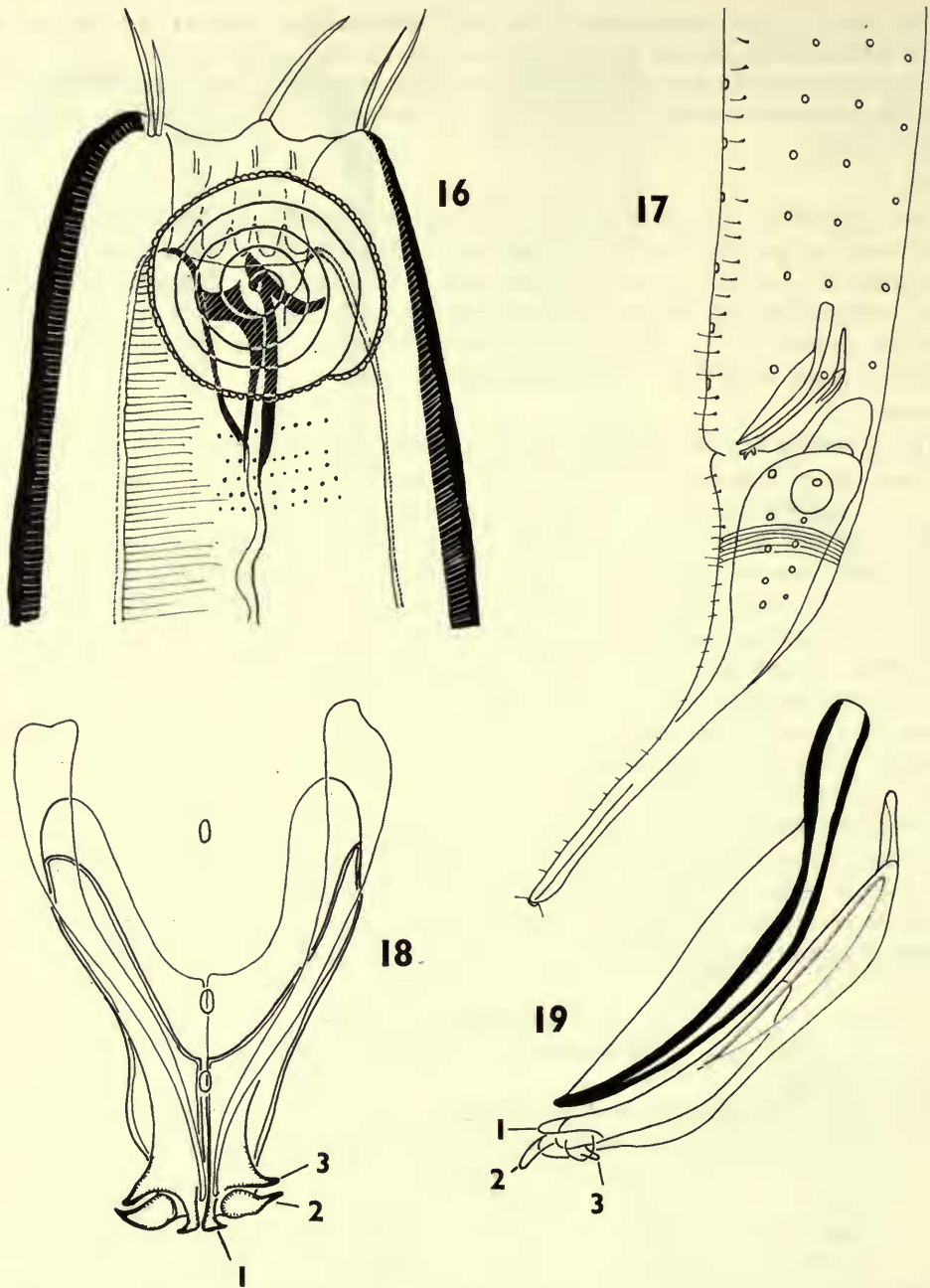
#### Material Studied

1 ♂, 1 ♀. Coarse white sand at a depth of 39 metres. 32° 05' S./18° 17' E. on 2.7.61 (Ref. No. WCD 93). B.M. (N.H.) Reg. No. 1962. 606/7.

	Ratios				Body Length (mm.)
	<i>a</i>	<i>b</i>	<i>c</i>	<i>V</i>	
Male	34.8	7.0	10.3		3.2
Female	28.3	5.8	8.8	53.2	2.6

MALE. Body breadth : 0.092. Oesophagus length : 0.46. Head diameter : 0.048. Length of cephalic setae, long/short : 0.018/0.016. Diameter of amphid : 0.030. Tail length : 0.31. Cloacal diameter : 0.084. Spicule length : 0.096. Gubernaculum length : 0.093.





FIGS. 16-19. *Choniolaimus wieseri* sp. nov. Fig. 16. Lateral view of head with dorsal surface to the right. Fig. 17. Lateral view of male tail. Fig. 18. Ventral view of spicules and gubernaculum. Fig. 19. Lateral view of spicules and gubernaculum (The numbers indicate corresponding structures).

FEMALE. Body breadth : 0.093. Oesophagus length : 0.45. Head diameter : 0.043. Length of cephalic setae, long/short : 0.018/0.015. Diameter of amphid : 0.024. Tail length : 0.30. Anal diameter : 0.084. Distance of vulva from anterior end of body : 1.40.

#### *Cuticle*

The cuticle is marked by transverse rows of small punctations and the lateral markings are slightly larger and further apart than those on the rest of the body. There are eight files of Type-1 campaniform organs running the full length of the body and there is a lateral file of seven Type-2 organs on each side of the body running posteriorly from the amphids with a similar set of five running posteriorly from the cloacal or anal openings. These campaniform organs are very similar in structure to the organs of the same name in the insects and the Type-1 is elliptical in shape with a sheet of cuticle projecting into it while the Type-2 is circular with a central boss (see Inglis, 1963).

#### *Head and Oesophagus*

The head is retracted in both specimens so that the amphid appears to lie far anteriorly and the cephalic setae appear to arise from the edge of the mouth opening (Text-fig. 16). The mouth is bounded by the usual twelve rugae ; there is a large dorsal cuticularized tooth-like structure and two smaller ventro-lateral tooth-like structures which are in fact two cuticular ridges seen in optical section—exactly as in *Longicyatholaimus dayi* (see p. 543). The amphid is large with five and a quarter spirals in both sexes. There is no oesophageal bulb or posterior expansion.

#### *Male*

The tail narrows rather suddenly posteriorly and anterior to the cloacal opening are ten small cup-like supplementary organs arranged in a file on the ventral surface of the body. These organs appear to be similar in structure to Type-2 campaniform organs but I cannot be sure on this point. In addition there are two files of stout ventro-lateral setae anterior to the cloacal opening. The spicules are simple with broad alae (Text-fig. 19). The gubernaculum is complex, almost as long as the spicules, with a dentate distal end. From the lateral aspect it appears slim and lightly built with a thin tail-like portion attached to its proximal end (Text-fig. 19) and with three small tooth-like structures developed from its distal end. In ventral view (Text-fig. 18) the massive structure of the gubernaculum is more easily appreciated and the tail-like proximal portion is seen to be extensive although rather delicate. The distal end has a pair of small tooth-like structures medially with two pairs of much larger structures flanking them. The corresponding parts are marked on Text-figs. 18 and 19.

#### *Discussion*

This species is certainly congeneric with *Choniolaimus macrodentatus* Wieser, 1959 and differs from it, apparently, in the structure of the gubernaculum, the number of pre-cloacal supplements, the shorter tail and the much longer cephalic setae. However, whether both species are congeneric with *C. papillatus* Ditlevsen, 1919 I am not sure. Thus Ditlevsen (1919) describes, and figures, a very distinct

post-oesophageal bulb and states "... there is no tooth in *Choniolaimus*". The dorsal tooth-like structure is very prominent in both *C. macrodentatus* and *C. wieseri* and there is certainly no oesophageal bulb in the latter species. Wieser does not comment on this point in describing *C. macrodentatus*. In spite of this I prefer to accept Wieser's interpretation of the genus and refer this new species to *Choniolaimus*, at least provisionally.

***Longicyatholaimus dayi* sp. nov.**

*Material Studied*

1 ♂, 1 larva. Khaki mud at a depth of 54 metres. 32° 05' S./18° 16' E. on 2.7.61. (Ref. No. WCD 94). B.M. (N.H.), Reg. Nos. 1962. 60/2.

	Ratios			<i>Body Length (mm.)</i>
	<i>a</i>	<i>b</i>	<i>c</i>	
Male	31.0	4.8	12.4	3.1
Larva	26.0	4.7	10.8	2.6

*Measurements (in mm. male first)*

Body breadth : 0.10 ; 0.10. Oesophagus length : 0.64 ; 0.55. Head diameter : 0.052 ; 0.043. Length of anterior cephalic setae : 0.008 ; 0.008. Length of posterior cephalic setae, long/short : 0.017/0.013 ; 0.018/0.013. Diameter of amphid : 0.014 ; 0.013. Distance of amphid from anterior end : 0.014 ; 0.011. Distance of excretory pore from anterior end of body : 0.21 ; 0.19. Tail length : 0.25 ; 0.24. Cloacal diameter : 0.082 ; 0.078. Spicule length : 0.065. Gubernaculum length : 0.038.

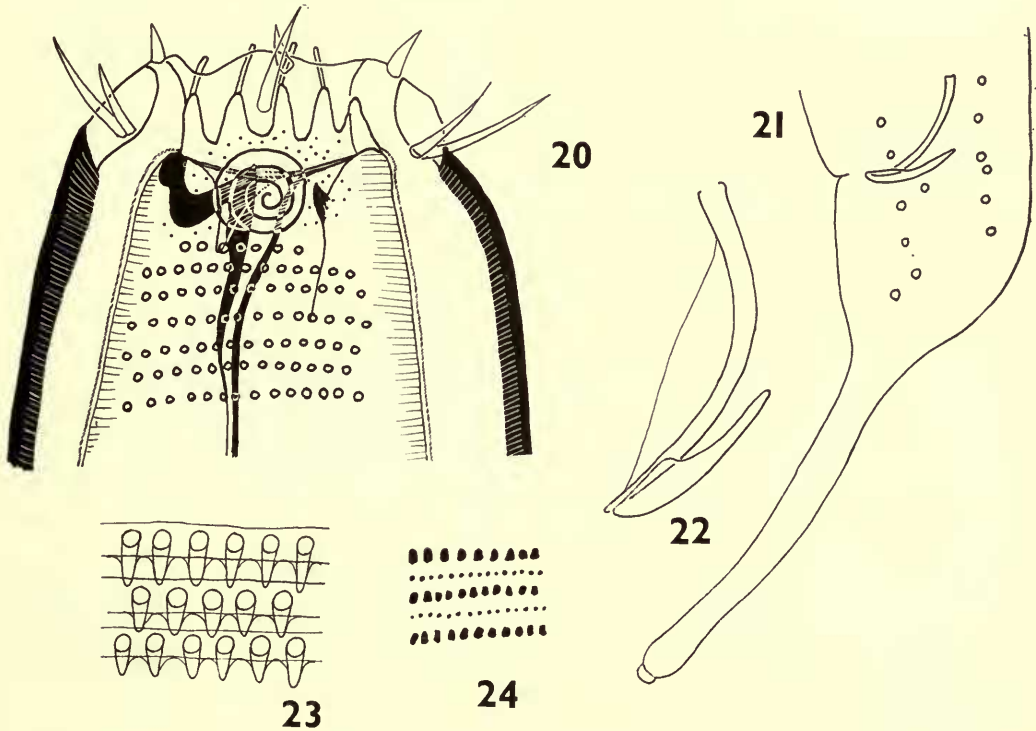
*Cuticle*

There is no lateral differentiation but the cuticular markings on the anterior end of the body from about the mid-point of the length of the oesophagus anteriorly are more prominent and different in shape from those more posteriorly. The more posterior markings take the form of alternate rows of large and small punctations which extend over the entire surface of the body (Text-fig. 24). The anterior markings are more complex and appear to move when studied under high magnification in a way comparable to the markings of the cuticle of *Euchromadora* species. The most obvious feature of the anterior cuticular marking is a series of transverse rows of large punctations (Text-fig. 20) which represent rods of dense material seen end on lying in the general mass of the cuticle at right angles to the plane of the external surface. These rods arise from an inner transverse ring of dense cuticular material lying in the inner part of the cuticle and end externally in a similar ring of dense material which is wedge-shaped in longitudinal section so that it is thin along its anterior edge and stout along its posterior edge. Thus the cuticle at the anterior end of the body is composed of a series of double rings of dense material, one external and one internal, connected by a series of rods of similar material. The external rings are so arranged that each lies partly over the ring immediately anterior to it and partly under the ring immediately posterior to it. The anterior edge of each external ring is uninterrupted while the posterior edge takes the form of a series of battlement-like processes which, as the rods of each

ring alternate with those of the rings immediately anterior and posterior to it, pass between the rods of the immediately posterior ring (Text-fig. 23). The structure of the cuticle in this species will be described and considered in much greater detail elsewhere. There are two lateral files of Type-1 campaniform organs (Inglis, 1963) on each side of the body which run the full length of the body. In one female specimen (which was not available to me before) I have found files of five Type-2 organs running posteriorly from the amphids just as in *Choniolaimus wieseri*.

#### *Head and Oesophagus*

The head is typically cyatholaimid with a mouth opening bounded by twelve rugae, an inner circle of six setose sense-organs and an outer circle of ten setae of which four are shorter than the other six. The amphid is spiral, with three and three quarter spirals in each specimen, and rather small (Text-fig. 20). The anterior end of the dorsal sector of the oesophagus is strongly cuticularized to form the usual tooth-like structure but the ventro-lateral sectors do not appear to be modified in a comparable way i.e. in accordance with the usual form of description, there are



FIGS. 20-24. *Longicyatholaimus dayi* sp. nov. Fig. 20. Lateral view of head with the dorsal surface to the left. Fig. 21. Lateral view of male tail. Fig. 22. Detail of spicules and gubernaculum. Fig. 23. Detail of cuticular structure on anterior end of body. Fig. 24. Detail of cuticular structure over major part of body (Figs. 23 and 24 are semi-diagrammatic).



no ventral teeth. The small tooth-like structure figured (Text-fig. 20) ventrally appears to arise from the edge of the ventral arm of the oesophageal lumen and appears to be unpaired. There is no posterior oesophageal swelling.

#### *Male*

The tail narrows rather suddenly about one third of its length posterior to the cloacal opening and terminates in a rather long flagellate portion. The spicules are lightly cuticularized and simple in structure with wide alae. The gubernaculum is simple and is wider proximally than it is distally (Text-fig. 22). There are no pre-cloacal supplements.

#### *Discussion*

This species differs from all others referred to the genus *Longicyatholaimus* in the simplicity of the gubernaculum, the form and length of the tail, in lacking lateral differentiation and, possibly, in the structure of the cuticular markings on the anterior end of the body. The possibility that it may warrant recognition as the type species of a new genus has been considered but in view of the rather poor condition of the specimens and the poverty of some of the descriptions available for related species I have preferred not to take this step.

#### *Xyzzors fitzgeraldae* gen. et sp. nov.

#### *Material Studied*

1 ♂. Khaki mud at a depth of 54 metres. 32° 05' S./18° 16' E. on 2.7.61. (Ref. No. WCD 94). B.M. (N.H.), Reg. No. 1962. 604.

Ratios			<i>Body Length (mm.)</i>
<i>a</i>	<i>b</i>	<i>c</i>	
45.6	6.8	15.3	3.6

#### *Measurements (in mm.)*

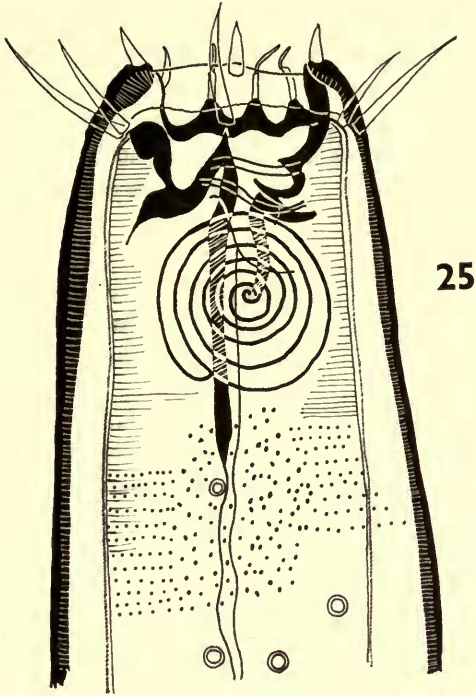
Body breadth : 0.079. Oesophagus length : 0.53. Head diameter : 0.048. Length of anterior cephalic setae : 0.005. Length of posterior setae, long/short : 0.020/0.018. Diameter of amphid : 0.023. Distance of amphid from anterior end of body : 0.018. Tail length : 0.236. Cloacal diameter : 0.077. Spicule length : 0.089. Gubernaculum length : 0.078.

#### *Cuticle*

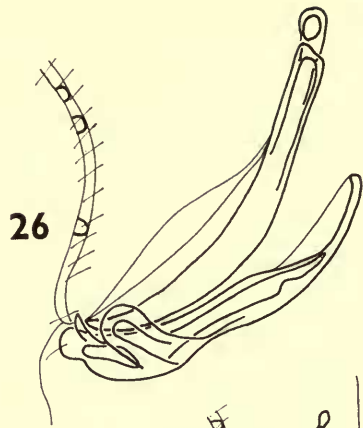
The cuticle is marked by transverse rows of fine punctations which are replaced laterally by larger, irregularly arranged punctations along the whole length of the body. There are eight files of Type-1 campaniform organs running the full length of the body.

#### *Head and Oesophagus*

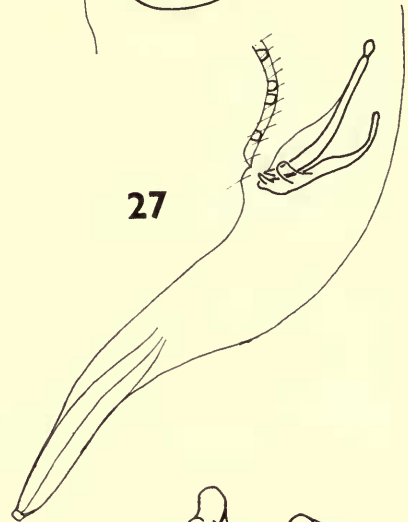
The head is blunt and bears six short setae in an inner circle and ten in an outer made up of six long and four short. The cuticular punctations start just posterior to the outer circle of setae. The amphids are large and multi-spiral with six and three-quarter spirals (Text-fig. 25). They are situated fairly far posterior to the anterior end of the body. The mouth opening is bounded by twelve rugae and the



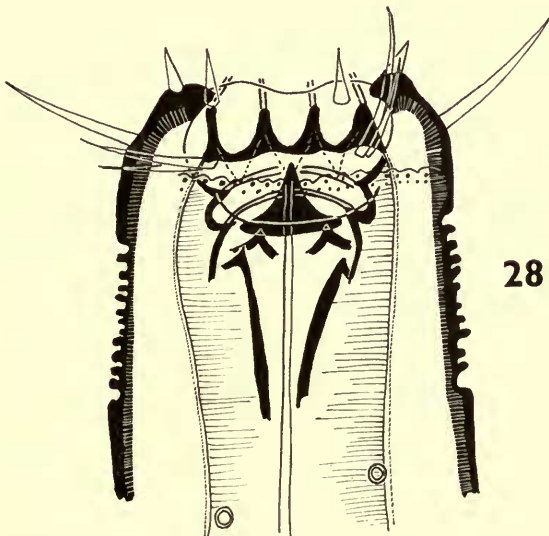
25



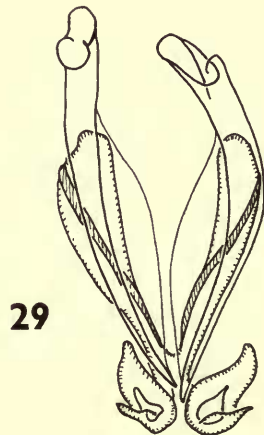
26



27



28



29

FIGS. 25-29. *Xyzzors fitzgeraldae* gen. et sp. nov. Fig. 25. Lateral view of head with the dorsal surface to the left. Fig. 26. Detail of spicules and gubernaculum from the side. Fig. 27. Lateral view of male tail. Fig. 28. Dorsal view of head. Fig. 29. Ventral view of gubernaculum and spicules.

anterior end of the oesophagus is highly modified with a large dorsal tooth-like structure and what appear to be two pairs of smaller ventro-lateral teeth. These latter structures are in fact two cuticular ridges running round the cavity at the anterior end of each ventro-lateral sector of the oesophagus seen in section. In addition to this the anterior ends of the ventro-lateral sectors appear to be slightly modified and covered with thickened cuticle (Text-figs. 25, 28). The oesophagus is simple without a posterior swelling.

#### *Tail and Reproductive Apparatus*

The tail is fairly slim and tapers to a fairly narrow terminal part. The spinnerette is not off-set, although this may be due to the condition of the specimen. There are six small cup-like pre-cloacal supplements which are rather indistinct (Text-fig. 27).

The spicules are much more elaborate than is usual in species of the Cyatholaimidae. They are broadly alate along their distal two thirds and in lateral view appear to be double proximally—that is they appear to divide into two distinct shafts (Text-fig. 26). In a ventral view, however, this division is not complete and is due to the broad proximal ends being grooved along their dorsal and ventral surfaces (Text-fig. 29). The gubernaculum is slim proximally but becomes much stouter and elaborate distally where there are two lateral processes on each side. One, the more proximal is large and rounded while the more distal is smaller and more sharply tipped (Text-figs. 26, 29). There are two files of long ventro-lateral setae on the surface of the body anterior to the cloacal opening.

#### *Discussion*

This species is most similar to those referred by Wieser (1954, 1959) to his genus *Biarmifer* but differs most markedly in the structure of the spicules and in the distinct, irregular lateral differentiation. Wieser describes the characteristic form of the spicules in the species he refers to *Biarmifer* as having “. . . two lists which are fused proximally and distally but separated medially by a lacuna”. The condition in the present specimen is very different from this and appears to be unique among the species referred to genera of the family Cyatholaimidae with the possible exception of *Nannolaimus complicatus* Gerlach, 1957 where the figure suggests a comparable division of the proximal end of the spicule. The form of the gubernaculum is similar to that in *Biarmifer gibber* Wieser, 1959 but is more complicated. In the structure of the buccal cavity the present species appears to be most similar to *Pomponema* Cobb, 1917 but differs from the species referred to that genus in the irregular lateral differentiation, the form of the spicules and the form of the pre-cloacal supplements.

I, therefore, propose to refer this species to a new genus, *Xyzzors*, which may be diagnosed thus :

Cyatholaimidae : Cyatholaiminae : lateral differentiation irregular running full length of body ; buccal cavity with a very large dorsal tooth-like structure ; spicules complex with doubled proximal ends ; gubernaculum complex distally with only two processes.

Type species : *Xyzzors fitzgeraldae* sp. nov.



## COMESOMATIDAE

*Mesonchium janetae* sp. nov.*Material Studied*

2 ♂♂, 1 ♀. Khaki mud at a depth of 54 metres. 32° 05' S./18° 16' E. on 2.7.61. (Ref. No. WCD 94). B.M. (N.H.), Reg. Nos. 1962. 599/600.

	Ratios			V	Body Length (mm.)
	a	b	c		
Males	30.0	10.2	17.1		4.8
	37.3	11.4	15.6		5.6
Female	27.8	10.2	16.1	48.0	5.0

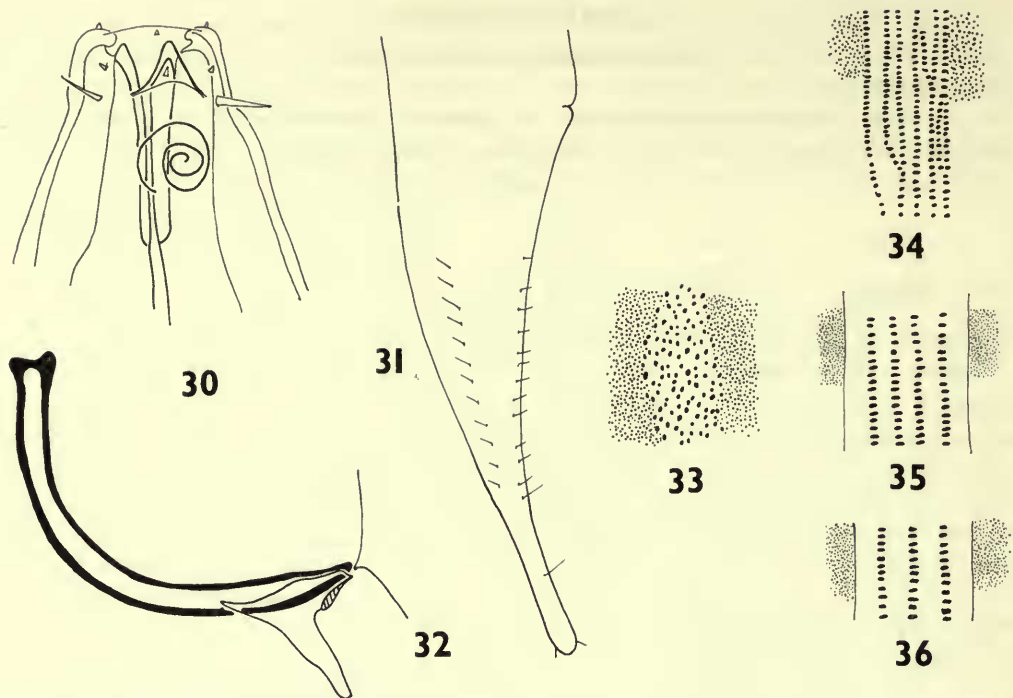
*Measurements (in mm. in order of body lengths above)*

MALES. Body breadth : 0.16 ; 0.15. Oesophagus length : 0.47 ; 0.49. Head diameter : 0.023 ; 0.024. Diameter of amphid : 0.012 ; 0.014. Distance of anterior edge of amphid from anterior end of body : 0.014 ; 0.011. Length of pharyngeal rods : 0.030 ; 0.030. Excretory pore from anterior end : . . . ; 0.29. Length of cephalic setae : 0.008 ; 0.008. Width of lateral differentiation, at posterior end of oesophagus/middle of body length/level of the cloacal opening : 0.024/0.020/0.025 ; 0.023/0.021/0.026. Tail length : 0.28 ; 0.36. Cloacal diameter : 0.12 ; 0.11. Spicule length : 0.22 ; 0.22. Gubernaculum length (= length of posterior apophysis) : 0.078 ; 0.075.

FEMALE. Body breadth : 0.18. Oesophagus length : 0.49. Head diameter : 0.023. Diameter of amphid : 0.012. Distance of anterior edge of amphid from anterior end of body : 0.013. Length of pharyngeal rods : 0.029. Excretory pore from anterior end : 0.25. Length of cephalic setae : 0.008. Width of lateral differentiation, at posterior end of oesophagus/ middle of body length/level of the cloacal opening : 0.023/0.028/0.025. Tail length : 0.31. Anal diameter : 0.12. Distance of vulva from anterior end : 2.4.

*Cuticle*

The cuticle is differentiated laterally over most of the length of the body by a clear zone of cuticle down which run three files of irregularly shaped dots (Text-fig. 36). Both dorsal and ventral to this clear zone the cuticle is marked by very small irregularly arranged dots which continue over the dorsal and ventral surfaces. That is, there is no unmodified zone dorsally and ventrally as in *Mesonchium nini* Inglis, 1961. Anteriorly and posteriorly this regular arrangement disappears, the number of files increases first to four (Text-fig. 35) and then, more anteriorly or posteriorly (at the anterior and posterior ends of the body respectively), five or six. Each file then tends to split into two for longer or shorter distances so that, for example, about the middle of the oesophagus there may be as many as seven or eight files of large punctations (Text-fig. 34) although the dominant number about the posterior end of the oesophagus and the level of the anterior ends of the spicules tends to be four. At the extreme anterior end of the body and posterior end of the tail the regular arrangement in files disappears completely by the files dividing irregularly and indefinitely to produce an appearance such as is shown in Text-fig. 33. As the regularity of the differentiation breaks down the unmodified zones



FIGS. 30-36. *Mesonchium janetae* sp. nov. Fig. 30. Ventro-lateral view of head. Fig. 31. Lateral view of male tail. Fig. 32. Detail of spicules and gubernaculum. FIGS. 33-36. Detail of lateral differentiation. Fig. 33. Just posterior to amphids. Fig. 34. About middle of oesophagus. Fig. 35. About posterior end of oesophagus. Fig. 36. Over the major part of the body length.

flanking the differentiation becomes increasingly narrow until they disappear completely and the major markings become smaller. This is exactly what happens in *M. nini* in which the lateral area, including the clear strips, remains roughly the same width down the whole length of the body while the amount of space occupied by the differentiation varies (see discussion below, p. 549). There are two long files of setae running down the body—one file on each side of the zone of differentiation.

#### *Head and Oesophagus*

The structure of the head is the same as in *M. nini*. In describing that species I referred to a difference in the sizes of the three teeth at the anterior end of the oesophagus but I am now sure that such a difference does not exist. All three structures are equally well developed. The amphid has two and three quarter spirals.

#### *Males*

The spicules are typical of the genus—relatively simple, slightly curved structures with slightly pointed distal ends. The gubernaculum is small with a prominent apophysis (Text-fig. 32). The tail is typical in shape (Text-fig. 31).

*Discussion*

The genus *Mesonchium* now contains five species: *M. poriferum* Cobb, 1920 (type species); *M. nini* Inglis, 1961; *M. pellucidum* (Cobb, 1920); *M. punctatum* Timm, 1961 and now *M. janetae* sp. nov. They are all very similar in appearance with very few characters which allow their separation other than the spectacular differences in the lateral differentiation, except possibly in the form of the gubernaculum. Cobb's (1920) descriptions of the form of the differentiation in his two species are insufficient to enable the species to be assessed with certainty but they are sufficient to show that *M. janetae* cannot be confused with either. In fact *M. janetae* is unique in the irregular appearance of the lateral differentiation at the anterior end of the body.

## NOTE ON THE STRUCTURE OF THE CUTICLE

The effective zone of lateral differentiation in the genus *Mesonchium* is the clear area, not simply the area covered by the large dots (This was the area measured to give the various width measurements for the lateral differentiation given on p. 547.) Now in both *M. janetae* and *M. nini* the width of this zone remains fairly constant while, where the number of files of dots is reduced the size of the dots increases. It appears that the ratio between the area of the dots and the area of cuticle, i.e. lateral differentiation as defined above, surrounding them remains constant. This suggests two things. Firstly, the zone of lateral differentiation is fairly sharply demarcated and is demarcated by factors other than those determining the occurrence of the large dots and secondly that, although the number of dots may be reduced, some factor applies to ensure that they still remain in a balanced relationship with the whole area of lateral differentiation around them. This is not restricted to the genus *Mesonchium*, although it is much more spectacular in this genus than in some others, since a comparable situation occurs in all other genera in which there is lateral differentiation. When the punctations are large the spaces between them are also larger than elsewhere on the body. Elsewhere (Inglis, 1962) I have argued that the modifications of the cuticle in the genus *Euchromadora* are largely restricted to the lateral aspects of the body because only there will they act to strengthen the cuticle while impeding the flexibility of the body by the smallest amount possible and the same argument can be applied to the cuticular modifications found in other chromadoroids, such as *Mesonchium*, *Longicyatholaimus*, *Pomponema* and many other genera of the families Cyatholaimidae, Chromadoridae, and Comesomatidae. This does not, however, explain the necessity for the relationship between the size of the punctations and the area with which they are associated. Wieser (1959) describes the lateral differentiation in a species of *Metacyatholaimus* as "In these longitudinal rows each dot is actually the upper disc of a cuticular dumb-bell-shaped structure that consists of a basal and an upper disc, connected by thin stem". (Wieser, 1959, p. 38. See also Wieser's fig. 36c), and exactly the same shape is shown by the large punctations in *Xyzzors fitzgeraldae* and in *Choniolaimus wieseri*. I would interpret these punctations of the cuticle as canals associated with moulting since their relationship with the area of clear surrounding cuticle

is most easily explained on the assumption that they supply something to the cuticle at some stage or another in the life cycle of the animal.

## MONYSTERIDEA

### LINHOMOEIDAE

#### *Limhomoeus timmi* sp. nov.

##### *Material Studied*

1 ♂. Khaki mud at a depth of 54 metres. 32° 05' S./18° 16' E. on 2.7.61. (Ref. No. WCD 94). B.M. (N.H.), Reg. No. 1962. 603.

Ratios			
<i>a</i>	<i>b</i>	<i>c</i>	Body Length (mm.)
166.7	24.2	23.5	7.5

##### *Measurements (in mm.)*

Body breadth : 0.045. Oesophagus length : 0.31. Head diameter : 0.018. Length of cephalic setae, long/short : 0.009/0.006. Length of cervical setae : 0.006–0.008. Distance of nerve ring from anterior end of body : 0.177. Distance of excretory pore from anterior end of body : 0.150. Diameter of amphid : 0.013. Distance of anterior edge of amphid from anterior end of body : 0.036. Tail length : 0.32. Cloacal diameter : 0.045. Spicule length : 0.063. Gubernaculum length : 0.039.

##### *Cuticle*

The cuticle is very thin and is marked by very fine, close set striations.

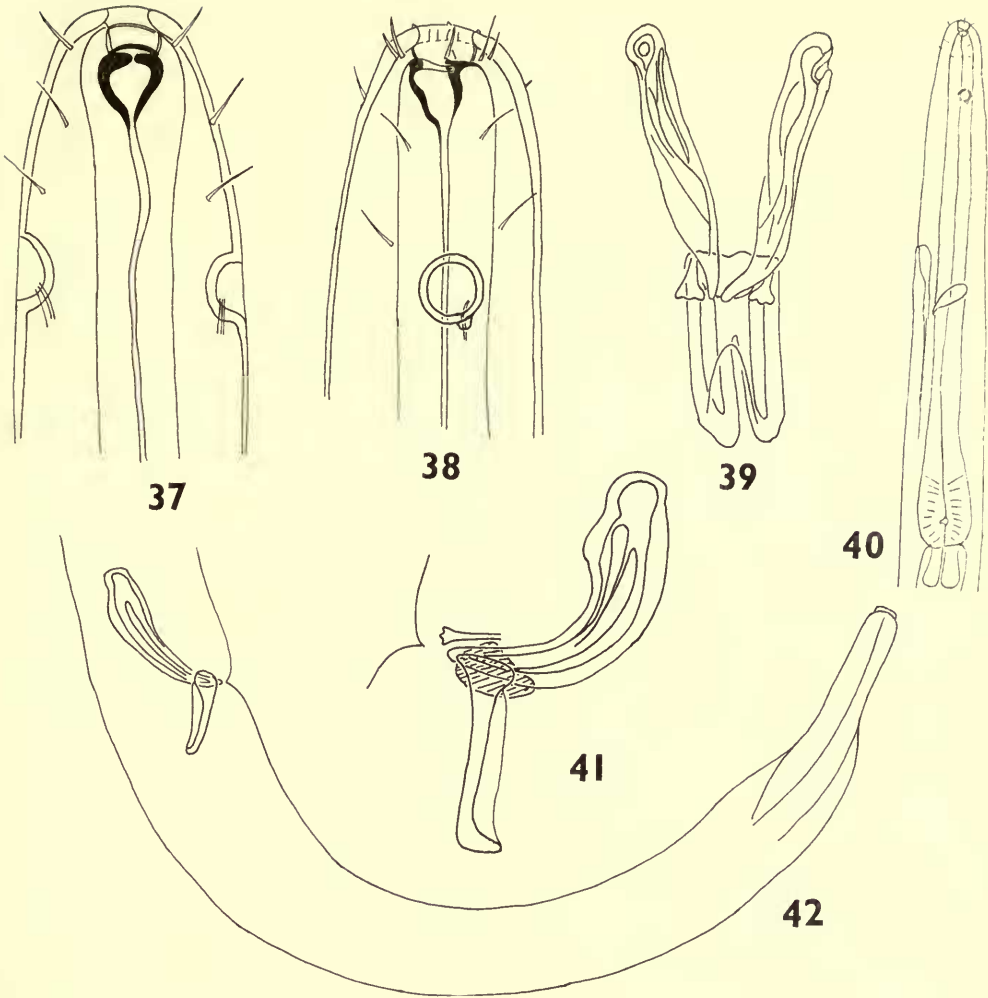
##### *Head and Oesophagus*

The head bears six small slightly setose papillae in the inner circle and ten setae in the outer of which six are longer than the remaining four. The anterior end of the oesophagus is modified to form a cavity by the reduction of the ventro-lateral sectors. The walls of the space so formed are composed of thickened cuticle and into the space projects the dorsal sector of the oesophagus as a cuticularized tooth-like structure (Text-figs. 37, 38). There are two circles of six cervical setae. The amphids lie relatively far posteriorly and the amphidial nerve enters them towards the dorsal side (Text-figs. 37, 38, 40). The oesophagus is long and thin with a slight, but distinct, posterior bulb (Text-fig. 40) and a prominent oesophageal-intestinal valve.

##### *Tail and Reproductive Apparatus*

The tail is long and narrow remaining roughly the same width along its entire length until just anterior to the posterior end where it narrows rather suddenly to a rounded tip (Text-fig. 42). The spicules are short, stout and elaborate (Text-fig. 41) and the gubernaculum has a distinct apophysis. There are rod-like structures developed from the lateral walls of the cloaca which expand distally to stout three pointed ends (Text-figs. 41, 42). Such structures are figured by de Man (1907) but do not appear to have been reported elsewhere.





FIGS. 37-42. *Linhomoeus timmi* sp. nov. Fig. 37. Dorsal view of head. Fig. 38. Lateral view of head with the dorsal surface to the right. Fig. 39. Ventral view of spicules and gubernaculum. Fig. 40. Oesophagus. Fig. 41. Lateral view of spicules and gubernaculum. Fig. 42. Lateral view of male tail.

### Discussion

This species appears to be most similar to *Linhomoeus hirsutus* Bastian, 1865 (as redescribed by Wieser, 1956) and *L. brevicaudatus* (Schuurmans Stekhoven, 1950) but differs in the form of the spicules, the extreme length of the tail and the posterior position of the amphid.

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